WR File NR: CS4-112932CL
WR Doc ID: 488396

State of Washington
REPORT OF EXAMINATION
FOR WATER RIGHT CHANGE

Add Point of Withdrawal

PRIORITY DATE	CLAIM NUMBER	CHANGE APPLICATION NUMBER
April 1909	S4-112932CL	CS4-112932CL

MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
Alan Moen and Susan Kidd **6701 Entiat River Rd** **Enitat WA 98822-9735**	

Total Quantity Authorized for Withdrawal or Diversion

WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
18	gpm	2.4

Purpose

PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Irrigation	18		gpm	2.4		Apr 1 – Oct 31

REMARKS

The application is to add a point of withdrawal to the existing surface water source of the Entiat River (Gaines Ditch). The current point of diversion is located approximately 2,400 feet upstream of the proposed point of withdrawal. The added source well (BCC647) has been drilled within the place of use.

IRRIGATED ACRES	
ADDITIVE	NON-ADDITIVE
0.6	

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Chelan	Entiat River	Columbia River	Entiat WRIA 46

SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Irrigation Well	252003310300	BCC647	25N	20E	03	NE SW	47.69229°	120.31703°
Diversion Ditch	252003230150	--	25N	20E	03	NW NW	47.69843°	120.32058°

Datum: WGS84

Place of Use (See Attached Map)

PARCELS

252003310300

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

That portion of the Northeast quarter of the Southwest quarter of Section 3, Township 25 North, Range 20 E.W.M., Chelan County, Washington, described as follows: Commencing at the West quarter corner of the said Section 3; thence North 89°10'04" East along the East-West centerline thereof a distance of 2236.61 feet to a point on the West right of way line of the Entiat River road; thence South 36°21'53" East along said West right of way line, a distance of 416.40 feet to a point of curve, said curve having a radius of 1075.27 feet; thence Southeasterly along said curve, through a central angle of 6°13'40", a distance of 116.88 feet to the True Point of Beginning; thence south 89°10'04" West distance of 143.99 feet; thence south 0°38'24" East a distance of 104.29 feet to an iron pipe; thence South 89°20'23" West a distance of 100.92 feet to an iron pipe: thence continuing South 89°20'23" West a distance of 50.00 feet to the center of the Entiat River; thence South 7°22'07" West along said centerline of the Entiat River, a distance of 148.19 feet; thence north 89° 10'04" East of a distance of 459.43 feet to the West right of the way line of the Entiat River Road and a point of curve to the left, said curve having a radius of 1115.27 feet; thence Northwesterly along said curve through a central angle of 3°13'11", a distance of 62.67 feet; thence North 89°10'04" West along said right of way a distance of 42.03 feet to a point on a curve, said curve having a radius of 1075.27 feet; thence Northwesterly along said curve through a central angle of 11°05'37" a distance of 208.19 feet to the True Point of Beginning.

Proposed Works

A 6-inch-diameter Irrigation Well (Unique Well ID BCC647) was drilled north of the vineyard and residence and approximately 200 feet east of the Entiat River. The irrigation well is connected to the existing irrigation system through a 2-inch line and 2.1-gallon pressure tank. The water is distributed through buried pipes and delivered to the vineyard through overhead sprinklers.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Begun	Completed	October 31, 2015

Measurement of Water Use

How often must water use be measured?	Monthly
How often must water use data be reported to Ecology?	Annually
What volume should be reported?	Total Annual Volume
What rate should be reported?	Annual Peak Rate of Withdrawal (gpm)

Provisions

Measurements, Monitoring, Metering and Reporting

An approved measuring device must be installed and maintained for the groundwater and surface water sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173, which describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements.

Recorded water use data shall be submitted via the Internet. To set up an Internet reporting account, contact the Central Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Central Regional Office for forms to submit your water use data.

Non-Additive to Confirmed Claims
The tentative determination made by Ecology for this requested change is not an adjudication of the claim. Water use under this authorization will be considered non-additive to any water rights confirmed for this claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

Proof of Appropriation
The water right holder must file the notice of Proof of Appropriation of water (under which the certificate of water right is issued) when the permanent distribution system has been constructed and the quantity of water required by the project has been put to full beneficial use. The certificate will reflect the extent of the project perfected within the limitations of the superseding permit. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

Schedule and Inspections
Department of Ecology personnel, upon presentation of proper credentials, will have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Real Estate Excise Tax
This decision may indicate a Real Estate Excise Tax liability for the seller of water rights. The Department of Revenue has requested notification of potentially taxable water right related actions, and therefore will be given notice of this decision, including document copies. Please contact the state Department of Revenue to obtain specific requirements for your project.

Department of Revenue	Phone:	(360) 570-3265
Real Estate Excise Tax	Internet:	http://dor.wa.gov/
PO Box 47477	E-mail:	REETSP@DOR.WA.GOV
Olympia WA 98504-7477		

Findings of Facts
Upon reviewing the investigator's report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I concur with the investigator that water is available from the source in question; that there will be no impairment of existing rights; that the purpose(s) of use are beneficial; and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. CS4-112932CL subject to existing rights and the provisions specified above.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of the Order.

File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.
- You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and Location Information

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 111 Israel Road SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

For additional information visit the Environmental Hearings Office Website: http://www.eho.wa.gov
To find laws and agency rules visit the Washington State Legislature Website: http://www.leg.wa.gov/CodeReviser

Signed at Yakima, Washington, this _____ day of _____, 2014.

_____
Mark Kemner, LHG, Section Manager
Water Resources Program/CRO

If you need this document in an alternate format, please call the Water Resources Program at 509-575-2490. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

INVESTIGATOR'S REPORT

BACKGROUND

On July 11, 2011, Alan Moen and Susan Kidd submitted an Application for Change/Transfer of Water Right to the Washington State Department of Ecology (Ecology). The application was assigned Change Application No. CS4-112932CL. Moen/Kidd proposes to add a point of withdrawal (POW) from a new well located within the place of use (POU) and approximately 2,400 feet downstream of the point of diversion (POD). The proposed water use is associated with the irrigation of an existing vineyard owned by the applicants. The intent is to fully use the groundwater source and only use surface water source in case of emergency such as well failure. Attributes of the existing Claim and the Application for Change are presented below in Table 1.

Table 1: Attributes of the Existing Water Right Claim and Proposed Change

Attributes	Existing	Proposed
Name	Howard and Alice Blackburn	Alan Moen and Susan Kid
Priority Date	April 1909 (Claimed)	April 1909 (Claimed)
Change Application Date	N/A	July 11, 2011
Instantaneous Quantity	0.04 cfs	0.04 cfs (18 gpm)
Annual Quantity	8 acre feet	8 acre feet
Purpose of Use	Irrigation	Irrigation
Period of Use	April through October	April 1 to October 31
Place of Use	NE¼SW¼ of Section 03, T. 25 N., R. 20 E.W.M. arcel 252003310300	Same
Point of Diversion	Entiat River (Gaines Ditch) NW¼NW¼ of Section 03, T. 25 N., R. 20 E.W.M.	Entiat River (Gaines Ditch), and Irrigation Well BCC647 in NE¼SW¼ of Section 03, T. 25 N., R. 20 E.W.M.
Irrigated Acres	2	1.92

Stated in a letter from Trout Unlimited accompanying the change application, the POD change is part of a larger effort being conducted by the Cascadia Conservation District to decrease direct diversions from the Entiat River. The biological benefits to this are numerous and important to the long-term management goals for the Entiat River as laid out in the Entiat (WRIA 46) Watershed Plan. The intent is to fully use the groundwater source and only use the surface water source in case of emergency such as well failure.

Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed Change Application No. CS4-112932CL.

Public Notice
A public notice of the application must be published in a local newspaper once a week for two consecutive weeks (RCW 90.03.280). The public notice of Change Application No. CS4-112932CL was published in the Wenatchee World during the weeks of December 27, 2012 and January 3, 2013.

State Environmental Policy Act (SEPA)
A water right application is subject to a SEPA threshold determination (i.e., an evaluation whether there are likely to be significant adverse environmental impacts) if any one of the following conditions are met.

- It is a surface water right application for more than 1 cubic-feet per second (cfs), unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cfs, so long as that irrigation project will not receive public subsidies;
- It is a groundwater right application for more than 2,250 gallons per minute (gpm);
- It is an application that, in combination with other water right applications for the same project, exceeds the amounts above;
- It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA);
- It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under WAC 197-11-305.

Because this Change Application does not meet any of these conditions, it is categorically exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law
Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, this Change Application has been processed by Licensed Hydrogeologists with GeoEngineers, Inc. under Ecology Cost-Reimbursement Agreement No. GEO005 (master contract No. C1000187).

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed. The point of diversion, place of use, and purpose of use may be changed if it would not result in harm or injury to other water rights.

The Washington Supreme Court has held that Ecology, when processing an application for change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp.*

The actual extent and validity of a water right claim can only be determined by a Superior Court in adjudication. Any tentative determination made on the extent and validity of a claim by Ecology as part of an application for change investigation is not an adjudication of the claim.

Administrative Status of Surface Water Bodies
Surface water bodies in the region are subject to administrative regulations governing the right to withdraw water for beneficial use. Minimum instream flow regulations for the Entiat watershed (Water Resource Inventory Area [WRIA] 46) have been adopted in WAC Chapter 173-546. Maximum future water right allocations in the Entiat River basin have been established for May 1 through July 15.

INVESTIGATION

The examination of the Application for Change of Surface Water Right Claim No. S4-112932CL submitted by Alan Moen and Susan Kidd was led by consultants from GeoEngineers, Inc. contracted as part of the Ecology's cost reimbursement program to facilitate the processing of the application. Kelsey Collins of the Water Resources Program, Ecology (Central Region), oversaw the examination and provided review.

The investigation included, but was not limited to, the review of:

- The State Water Code, specifically Title 173 Washington Administrative Code (WAC) and Title 90 Revised Code of Washington (RCW).
- United States Geological Survey (USGS) topographic maps.
- Washington State Department of Ecology, 2012, Washington State Well Log Viewer website, <http://apps.ecy.wa.gov/welllog/index.asp> (Accessed November 2012).
- Washington State Department of Ecology, 2012, Water Rights Tracking System (WRTS) website <http://www.ecy.wa.gov/programs/wr/rights/tracking-apps.html> (Accessed November 2012).
- Kirk, T., P. Kerr, and H. Riddle, 1995, Draft: Initial Watershed Assessment, Water Resources Inventory Area 46, Entiat River Watershed. Washington Department of Ecology Open File Report 95-02.
- Long, W. A., 1951, Glacial Geology of the Wenatchee-Entiat Area, Washington. Northwest Science 25, 3–16.
- Tabor, R. W., V. A. Frizzell, Jr., J. T. Whetten, R. B. Waitt, D. A. Swanson, G. R. Byerly, D. B. Booth, M. J. Hetherington, and R. E. Zartman, 1987, Geologic Map of the Chelan 30-Minute by 60-Minute Quadrangle, Washington. Map 1-1661. U.S. Geological Survey. Miscellaneous Investigations Series.
- Chelan County Conservation District (CCCD), October 2004, Entiat Water Resources Inventory Area (WRIA) 46 Management Plan.
- Walker, K., 2009, Technical Memorandum: Hydrogeologic technical analysis for Water Right Change Application Nos. CS4-069703CL@1, CS4-069703CL@2, CS4-069703CL@3, CS4-069703CL@4 and CS4-069703CL@5, Chelan County, Washington. Report by Kurt Walker and reviewed by Thomas Mackie.
- Schroeder, D. R., 1987, Analytical Stream Depletion Model: Ground Water Software Publication No. 1, Office of the State Engineer, Colorado Division of Water Resources.
- Google Earth aerial photographs from 1998, 2005, 2006, 2009 and 2011.
- Photocopies of aerial photographs from 1965, 1988 and 1994 were obtained from the Chelan County Assessor's office in Wenatchee.
- Photocopies of 1945 aerial photographs were provided by Ecology.
- Information submitted by and conversations and/or meetings with the applicant Alan Moen, Kurt Hosman of Cascadia Conservation District and Jason Hatch of Trout Unlimited.
- A site visit on December 4, 2012.

History of Water Use

The original POD that supplied the Moen/Kidd property was described as being located approximately 2.5 miles upstream of the current POD (Gaines Ditch). As a result of flooding in 1948, the original POD was changed to the current POD located on the Entiat River (see Attachment 1), based on the petition for change submitted on October 5, 1950 by Frank A. Gollaher, A.J. Mars, Tessie Cruver and S.S. Gaines.

The Moen/Kidd property is located in the Entiat River valley, Water Resource Inventory Area (WRIA) 46. The single parcel (Parcel No. 252003310300) is 1.92 acres, comprised of a homestead, 0.3 acres of vineyard and 0.3 acres of turf located at about river-mile (RM) 6.2 (see Attachment 2). The Moen/Kidd property lies in the valley bottom bounded to the west by the Entiat River and to the east by Entiat River Road.

The Moen/Kidd property historically included an orchard that was irrigated using surface water from the Gaines Ditch diversion located approximately 2,400 feet upstream of the property. On June 10, 1974, Howard and Alice Blackburn submitted to Ecology a Claim (No. S4-112932) that asserts a surface water right to 0.04 cfs, 8 acre-feet per year (af/yr), for the irrigation of 2 acres from April through October. The claimed date of first putting water to use is April 1909. Sometime between 1988 and 1997, the fruit trees were removed. In 1999, a 0.3-acre area was replanted with grapes (Snowgrass WineryVineyard).

Proposed Point of Withdrawal

The request is to add a new POW to the existing POD from the Entiat River. A well log for Irrigation Well BCC647 was obtained from Ecology's database. The proposed POW is a 6-inch diameter well drilled in June 2011 to 52 feet and completed with 10 feet of 0.020-inch-slot stainless steel screen placed from 39 to 49 feet depth. The well is located approximately 40 feet northeast of the residence, 200 feet from the Entiat River, and approximately 385 feet west and 685 south of the center of Section 3, in the NE¼SW¼. The intent is to use the new POW as the main source and the existing POD is to be used only in the case of emergency, such as well pump failure.

Site Visit

A site visit was conducted by Joel Purdy, Senior Hydrogeologist with GeoEngineers, on December 4, 2012. Alan Moen provided a tour of the place of use, point of withdrawal and irrigation system. The locations of the POW and POU were recorded using a GPS mapping system. Photographs were also taken of facilities.

The surface water was obtained from a line off the Gaines Ditch. The valve and treatment system is located in a small shed about 30 feet east of the proposed POW. The valve connecting the surface water source was shut at the time of the visit. Groundwater is pumped from the well through 2-inch-diameter pipe to the valve where it enters the existing irrigation system of buried pipes.

Overhead and manually placed sprinklers were observed within the vineyard area. The remaining turf/pasture areas are irrigated manually. A 2-inch totalizing flow meter was observed at the wellhead and it read 080574 gallons. The irrigation well was not pumping at the time of the visit.

Extent and Validity

Aerial photographs from 1945 to 2011 were obtained from public sources. These aerial photographs were reviewed to assess the irrigated areas after 1967 per RCW 90.14.160. There are two main areas of irrigation on the Moen/Kidd parcel:

1) a main block of vineyard that is the eastern portion of the parcel; and
2) the lawn, landscaping and miscellaneous trees surrounding and south of the residence. Area 1, approximately 0.3 acres, is irrigated using overhead 1-inch impact sprinklers. Area 2, approximately 0.3 acres, is irrigated with hand-placed lawn sprinklers and impact sprinklers.

It appears that Area 1 contained fruit trees from 1965 to 1988. Sometime between 1988 and 1997, the trees were removed. The quality and scale of the 1994 aerial photograph is such that it is not apparent whether Area 1 has open pasture or orchard at the time, but Area 1 does appear to be irrigated in 1994. The 1997 County Land Survey Report document for the parcel noted that the "fruit trees are gone, idle land". However, there is no indication of when the trees were removed prior to the 1997 survey. The grape plants were reportedly planted in 1999. By 2006, the vineyard is evident in the aerial photographs.

It appears that both areas have been irrigated continuously either for fruit trees, pasture or grapes based on the information for the period of available aerial photography, apart from a brief hiatus for Area 1 at least between 1997 and 1999. There was no definitive evidence found to indicate that irrigation was discontinued for any full 5-year period.

The irrigated areas estimated above appear to have been irrigated continuously for the last 5 years and consistanly before that, based on the review of the available aerial photographs. For the Entiat watershed, the average monthly and seasonal irrigation water usage applicable to commercial agriculture was estimated for fruit tree and pasture/turf irrigation in WAC 173-546-070 (Table 4-15). The estimates were for an average condition and for 65 percent application efficiency. Use for the irrigation of pasture/turf is 2.64 to 4.06 acre-feet per year per acre (af/ac), respectively. The usage rate for vineyards (grapes) is estimated in the Washington Irrigation Guide (2007) Appendix A as 1.79 af/ac. This rate is equivalent to 2.75 af/ac at 65 percent application efficiency. Thus, for the average water use at the Moen/Kidd property:

0.3 ac of vineyard x 1.79 af/ac = 0.54 af
0.3 ac of turf/pasture x 2.64 af/ac = 0.79 af
Total Annual Consumptive Quantity (ACQ) = 1.33 af

For 65 percent application efficiency:

0.3 ac of vineyard x 2.75 af/ac = 0.83 af
0.3 ac of turf/pasture x 4.06 af/ac = 1.22 af
Total ACQ = 2.05 af

For the original Claim, a 4 af/ac irrigation rate was used to arrive at an annual usage of 8 af/yr for irrigating 2 ac. Applying the same 4 af/ac rate to 0.60 total irrigated acres gives 2.4 af/yr. Thus, the claimed amount of 8 af/yr appears to be more than is needed for beneficial use by the Moen/Kidd vineyard.

Other Water Rights Appurtenant to the Place of Use
Information on water rights in the Entiat River valley was obtained from Ecology's Water Resources Explorer online database. There appear to be no other applications, water rights or claims for the subject POU. There are four surface water rights and five groundwater rights downstream within the Entiat River Valley. There are also 65 groundwater claims and 35 surface water claims downstream of the Moen/Kidd property.

Hydrologic/Hydrogeologic Evaluation
The following is a discussion of the hydrogeologic and hydrologic characteristics in the vicinity of the Change Application.

Well Location
The Moen Irrigation Well is located about 200 feet from the left bank of the Entiat River and about 150 feet from a potential domestic well (not observed) associated with the adjacent residence to the north. The groundwater level in the Irrigation Well is reported on the log for Well BCC647at a depth of 10 feet below the top of the well.

Hydrologic Setting
The Entiat River originates from the eastside of the Cascade Mountains, flows southeast through the valley between the Chelan and Entiat Mountains, and joins the Columbia River about 9.5 river-miles downstream near Entiat, WA. A large portion of the annual precipitation in the basin falls as snow and forms the winter snowpack. Spring temperatures and rain release water accumulated in the snowpack. The snowpack runoff is the dominant source of streamflow and groundwater recharge in the basin. For the USGS stream gage (#12453000)at Entiat (RM 0.5) from 1911 through 1925 and 1951 through 1958, the mean annual flow ranged from 275 to 800 cfs, peak annual flow ranged from 1,100 to 10,800 cfs and the 7-day mean low-flow ranged from 45 to 120 cfs (CCCD, 2004). The Entiat River gage was moved to near Keystone (#12452990 at RM 1.4) in 1996. Runoff is highly variable within the watershed. Data from the USGS gage near Ardenvoir (#12452800) show that in the water year 1972 the annual streamflow was 451,140 af. The next year the flow was 178,970 af (Kirk et al., 1995)

Geologic Setting
The deeply incised Entiat River valley is underlain by metamorphic and plutonic bedrock that is overlain by volcanic ash, regolith, and unconsolidated glacial and alluvial sediments. The bedrock was formed before the Tertiary period and consists mainly of gneiss, amphibolite, tonalite, gabbro, schist, marble and quartzite. The hillslopes at both sides of the river are mainly composed of tonalite and tonalite gneiss of the late Cretaceous Entiat Pluton (Tabor et al., 1987).

The unconsolidated sediments within the Entiat River valley include glacial tills and outwash originating from the Peshastin and Leavenworth Stage glaciers during the last Ice Age (Long, 1951) and younger surficial alluvium. The sediments mainly contain moderately sorted cobbles, sand and gravel (Long, 1951; Tabor et al., 1987). Below Ardenvoir, where the subject area is located, the valley is generally unglaciated and the unconsolidated deposits are generally reworked glacial material and alluvium consisting of moderately sorted cobbles, sand and gravel that overlie the bedrock. The thickness of the unconsolidated deposits is typically between 50 and 100 feet within the unglaciated portion of the Entiat River valley (Kirk et al., 1995).

Hydrogeologic Analysis
The Entiat River valley forms a laterally bounded system with groundwater in the alluvial flood plain in direct hydraulic continuity with the Entiat River. The aquifer tapped by Irrigation Well BCC647 is comprised of approximately 40-feet-thick deposits of unconsolidated alluvium. Water that is pumped from the irrigation well is derived in part from the river, and causes drawdown in the aquifer that intercepts a portion of (or reduces) groundwater discharge from the aquifer as baseflow to the river. Consequently, the net effect on river flow of changing to a groundwater source is generally less than if all the water came directly from the river, as is the case with the existing surface water diversion.

Estimates for transmissivity of the unconsolidated deposits in the upper Entiat River valley range from 12,000 to 60,000 gallons per day per foot (gpd/ft) based on analysis of pumping test data (Kirk et al., 1995). A 62-feet-deep well located approximately 500 feet upstream of the Moen Irrigation Well was pumped at 125 gpm with 35 feet of drawdown after 4 hours. These pumping test data suggest a high transmissivity at the Moen/Kidd location as seen in the upper valley.

Impairment
The only pumping test data available for the Moen Irrigation Well is as provided on the Ecology well log. The test data reported on the well log indicates that the well was air-lifted at 30+ gpm for an unknown period of time. However, aquifer transmissivities are assumed to be high based on pumping tests conducted elsewhere in the valley. An analysis of potential impairment was conducted assuming an aquifer transmissivity of between 12,000 and 60,000 gpd/ft. The interference drawdown at a distance of 150 feet is expected to be less than 0.5 foot based on image well theory taking into account the positive boundary of the river and the negative boundary of the valley walls. Thus, the use of the Moen Irrigation Well at a rate of 18 gpm will not impair other groundwater or surface water users in the vicinity based on available information.

Same Source Consideration
To change from a point of diversion to a point of withdrawal, the well must be in direct hydraulic continuity with the original surface water source. Direct hydraulic continuity exists when, as a result of pumping the proposed well, additional water from the original surface water source will flow into and recharge the aquifer where it can eventually be captured as ground water. Additionally, the proposed well must be located and constructed such that, within a short time after pumping starts, the majority of the pumped water should be derived from, or replaced by, the surface water source; and within a short time after pumping stops, the ground water that has been removed from aquifer storage should be replaced by infiltration from the surface water source. This requirement ensures that the POW can be managed in the same manner as the POD. An analytical groundwater flow model that included representation of the river was used to evaluate the hydraulic relationship between the original source of water and the proposed well.

The Integrated Decision Support Alluvial Water Accounting System (IDS AWAS) was used to compute amount and timing of pumping-induced stream flow depletion from operation of the proposed well based on the Analytical Stream Depletion Model (ASDM) (Schroeder, 1987). The rate and timing of stream depletion are dependent on the properties of the subject aquifer and the distance between the pumping well and the stream. In general, the greater the distance between the pumping well and the stream, the greater the time period is between pumping and stream flow impact. The aquifer characteristics and well properties described above were used to define the ASDM parameters. An average pumping rate of 18 gpm and a transmissivity of 30,000 gpd/ft were used to predict the rate and timing of stream depletion of the Entiat River. The model predicts that after one day of pumping,

stream depletion accounts for approximately 60 percent of the water drawn from the proposed wells. Similarly, when the pumping ceases, stream depletion is expected to decrease by more than 60 percent within one day. For a one day of continuous pumping, the predicted stream depletion reaches 90 percent after 17 days. The longer time of stream depletion is because the well is 200 feet away from the Entiat River, and the pumping rate is only 18 gpm. As a result, the proposed well is considered to be in direct hydraulic continuity with the Entiat River, and the well can be effectively managed in the same manner as the historic POD.

Availability

Precipitation and snowmelt within the drainage basin provide water to maintain streamflow and groundwater levels. The Moen Irrigation Well (BCC647) was successfully air-tested after construction at over 30 gpm for an unknown period of time. Based on its location and shallow depth, the inferred source aquifer is likely in hydraulic continuity with the adjacent Entiat River. Water is therefore physically available to meet the claimed withdrawal of 0.04 cfs, or 18 gpm, and 2.4 af/yr at the point of withdrawal to provide a supply for irrigation use by the applicant.

There are no closures on surface water bodies in WRIA 46. Therefore, surface water is legally available for appropriation. The water use authorized under this change will be considered non-additive to any water rights confirmed for said Claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

Impairment Consideration

The requested Change Application is for use from a well that is located approximately 150 feet from the nearest well and will not impair existing users. The change from a direct surface water diversion to a groundwater withdrawal will buffer the impacts to the Entiat River and the Claim will not be increased and therefore will not impair existing water rights.

Public Interest Considerations

RCW 90.03.290 requires that a proposed appropriation not be detrimental to the public interest. The seasonal withdrawal from April 1 through October 31 for irrigation at the Moen/Kidd property is consistent with state policy without adversely impacting instream flows or other public needs and values. No detriment to public interest could be identified during the examination of the subject application.

The new point of withdrawal is intended to replace the diversion in the future. Removing PODs and instream structures from a river has a positive impact on aquatic habitat. Diversions and instream pumps require frequent servicing that involves entering the river to repair structures, remove silt and debris from screens, and maintaining pushup dams. Replacing a POD with a POW alleviates the need for repeated construction in the river and the associated disturbances from increased silt loading and streambank modifications.

Consideration of Protests and Comments

A protest was received by Ecology on January 30, 2013 during the public notice period from J.J. Jones. Mr. Jones asserted that only 0.127 ac are actually irrigated based on County Assessor's records and his estimation, and that the property was "*IDLE* for many years." Mr. Jones's protest and information was considered. However, based on a review of aerial photos and confirmation during a site visit, there are 0.3 ac of vineyard and 0.3 ac of pasture and lawn being irrigated within the 1.92 ac of the Moen/Kidd parcel. Additionally, the County's Land Survey Record does note in 1997 that the land was idle, but no

time period of idleness is stated. Admittedly, the information for the period between 1988 and 2006 is not substantial. However, there is insufficient evidence to demonstrate that there was no irrigation conducted on Moen/Kidd parcel for a full 5-year period. Thus, relinquishment of the claim is not warranted.

CONCLUSIONS

Approving Change Application No. CS4-112932CL will not impair existing water users.

RECOMMENDATIONS

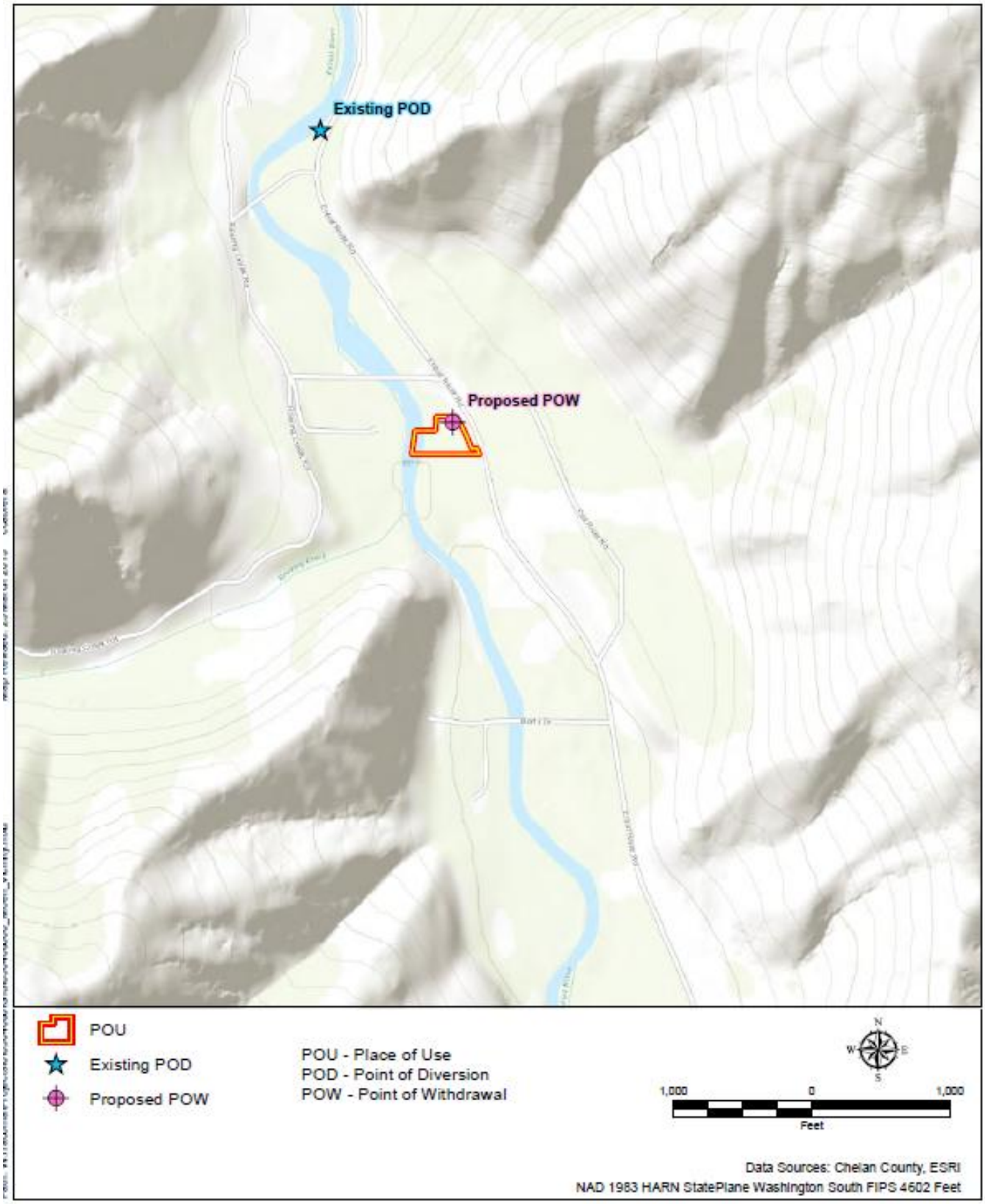
Based on the information presented above, the author recommends that:

> Change Application No. CS4-112932CL be approved in the amounts, and subject to the provisions described in the Order for Report of Examination No. CS4-112932CL, pages 2-3.

Report by: _____ _____
Joel W. Purdy, LG, LHG Date

Reviewed by: _____ _____
Kelsey Collins Date

Attachment 1: Existing Point of Diversion and Proposed Point of Withdrawal for the Moen/Kidd Change Application No. CS4-112932CL.



Attachment 2: Place of Use, Proposed Point of Withdrawal and Irrigated Areas for the Moen/Kidd Change Application No. CS4-112932CL.